Biofilms- What Are They and How Do We Prevent Them?

Proper Cleaning and Sanitizing Procedures in a Food Service Setting

Loreena Hilton & Jessica Jutz
Agenda

- What is a biofilm?
- Are biofilms harmful?
- How do they form?
- Biofilms in the kitchen?
- How do we prevent them?
What is a biofilm?

99% of bacteria live in biofilms
Biofilms in the world
Biofilms in the world
Biofilms in the world
Are biofilms harmful?

- Can cause illness in humans.
- Can damage equipment.
- Can help with water filtration.
- Can help with decay of materials.
How do they form?
I just can't go with the flow anymore. I've been thinking about joining a biofilm.

This Slime Smile created by Jamie Pennington
Biofilms protect member bacteria

Where can Biofilms be found in the Kitchen?

- Ice machines
- Slicers
- Waste lines
- Floor Drains
- Prep tables
- Cutting boards

![Gourmet Ice Machine With Slime/Mold Buildup](image_url)
How to tell if a Biofilm is present

- Rainbow sheen on stainless steel
- Slimy feel or visual slime build-up
- Odor- due to lack of cleaning
Implications of Biofilms in a Food Service Setting

- Foodborne illness: bacteria such as Listeria, Salmonella, Pseudomonas, and Bacillus Cereus all form biofilms
- Listeria - wet environments, Pseudomonas - stainless steel
- Non-food contact surfaces

Nearly 30% of food processing drains tested positive for listeria
Source: USDA
Implications Continued

- Pests: fruit flies and other insects
- Damage to equipment and facility (corrosion of pipes)
More Biofilms....
Ice Video

http://www.youtube.com/watch?v=9TS0PAgofkk
Proper Cleaning Steps to Prevent and Remove Biofilms

- **Dry-clean:** Remove any visible scraps of food and debris
- **Potable Rinse:** Rinse off any remaining debris with potable water
Proper Cleaning continued

- Wash with Detergent/soap: Use mechanical action (scrubbing) to remove any organic matter
Proper Cleaning Continued

- **Second Rinse:** Rinse off soapy water and organic matter
- **Sanitize:** Use an effective sanitizer at the correct concentration
  - Chlorine: 50-100ppm
  - Quaternary Ammonium: 200-400ppm
  - Higher concentrations may be used if removing a visible biofilm
- **Air dry:** Allow equipment and surfaces to air dry
How to prevent Biofilms

- Use approved equipment: NSF approved, smooth and easily cleanable, free of pits and scratches
- Maintain facility: smooth floors, walls, and ceilings
Prevention Continued

- Proper cleaning and sanitizing procedures
- Frequency of Cleaning
Questions???
References

3. http://www.hypertextbookshop.com/biofilmbook/v005/r001/Contents/01_Topics/01_Chapter_1/01_Section_1/01_Beginner/01_Page_1.html